
DOE Meeting on ***BALANCING NATURAL GAS
SUPPLY AND DEMAND***

Natural Gas Infrastructure Overview

December 19-20, 2005

Recent Pipeline Projects, 2003 through 2005

◆ **NPC Projected Pipeline Project Totals**

- 25 Major Interstate Pipeline Projects
- 5.5 Bcfd of Capacity Added

◆ **Actual Pipeline Project Totals**

- 38 Major Interstate Pipeline Projects
 - 10.2 Bcfd of Capacity Added
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◆ **Northeast**

- NPC Projection: 6 projects/1.3 Bcfd
- Actual Builds: 5 projects/1.3 Bcfd

◆ **Midwest**

- NPC Projection: 0 projects/0 Bcfd
- Actual Builds: 1 project/0.2 Bcfd

◆ **Central**

- NPC Projection: 1 project/0.5 Bcfd
- Actual Builds: 2 projects/0.6 Bcfd

◆ **Southeast**

- NPC Projection: 8 projects/1.2 Bcfd
- Actual Builds: 12 projects/2.6 Bcfd

◆ **Gulf**

- NPC Projection: 3 projects/0.8 Bcfd
- Actual Builds: 8 projects/2.9 Bcfd

◆ **West**

- NPC Projection: 7 projects/1.8 Bcfd
- Actual Builds: 8 projects/2.6 Bcfd

Source: EEA compilation of EIA and FERC data.

Proposed Pipeline Projects, Post-2005

◆ Proposed Pipeline Project Totals

- 5.3 Bcfd Certificated (11 Projects)
 - 6.8 Bcfd Pending (10 Projects)
 - 13.0 to 15.7 Bcfd Announced (17 Projects)
 - *NPC: 26.1 Bcfd*
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◆ Arctic Pipeline Projects

- 3.2 to 6.0 Bcfd - Proposed
- *NPC: 4.0 Bcfd*

◆ Northeast Pipeline Projects

- 0.5 Bcfd Certificated
- 0.9 Bcfd Pending
- 1.4 Bcfd Announced
- *NPC: 4.5 Bcfd*

◆ Central Pipeline Projects

- 0.2 Bcfd Certificated
- 4.0 Bcfd Announced
- *NPC: 1.1 Bcfd*

◆ Gulf Pipeline Projects

- 1.8 Bcfd Announced
- *NPC: 8.9 Bcfd*

◆ Midwest Pipeline Projects

- 0.4 Bcfd Certificated
- 1.0 Bcfd Announced
- *NPC: 1.1 Bcfd*

◆ West Pipeline Projects

- 2.6 Bcfd Certificated
- 1.0 Bcfd Pending
- 1.5 Bcfd Announced
- *NPC: 4.4 Bcfd*

◆ Southeast Pipeline Projects

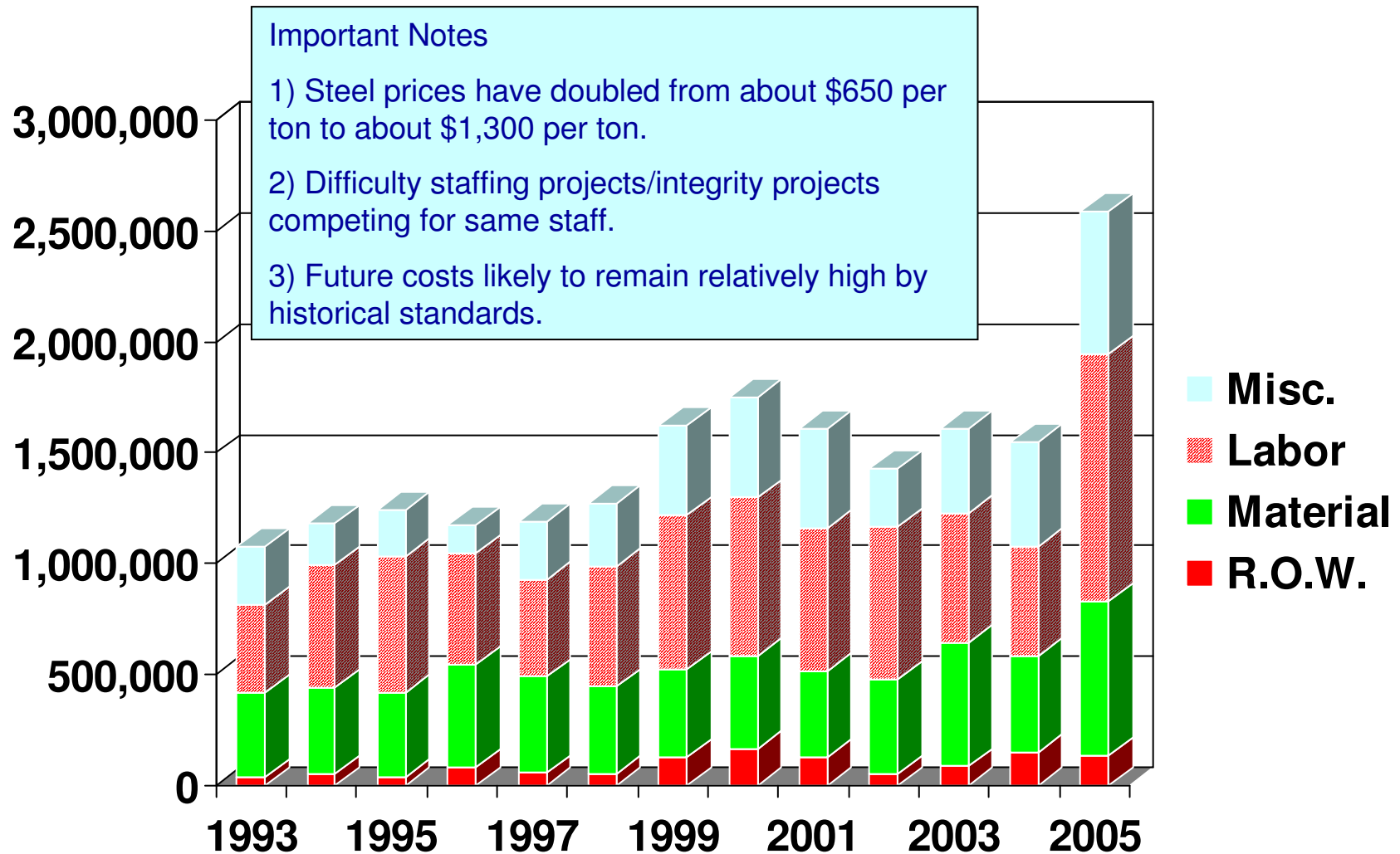
- 1.7 Bcfd Certificated
- 1.7 Bcfd Pending
- *NPC: 2.1 Bcfd*

Sources: EIA Office of Oil and Gas, NPC Study.

Note: NPC values represent post-2005 capacity added in Reactive Path.

Natural Gas Infrastructure Overview

Pipeline Cost Trends -- Nominal \$/Mile, 30 and 36 inches



Source: Oil and Gas Journal.

Observations: Pipeline Infrastructure

- ◆ **Actual pipeline capacity built exceeds NPC projection during past few years.**
 - Pipeline construction proceeding as expected except in the Northeast where new projects face significant hurdles.
 - Capacity expansions generally following market signals, not built in advance of market changes (consistent with NPC assumption).
 - New pipeline capacity likely to be more expensive than NPC had projected.

- ◆ **Two competing projects to move gas from the Rockies as far east as Ohio, each up to 2 Bcfd of capacity.**
 - These projects were not included in NPC. Rocky Mountain gas development appears to be more robust than NPC had projected, and Midcontinent pipelines appear to be more constrained than NPC had projected.

- ◆ **New projects to expand capacity out of Barnett Shale and Carthage areas as far downstream as Northeast Louisiana, 4 different projects proposed.**
 - NPC did not foresee these projects as supply development in the areas was not projected to be as robust as it has been.

NPC's LNG Import Projection (Reactive Path)

Annual Imports and Exports by Terminal in Average MMcfd

NPC Reactive Path

		2003	2004	2005	2010	2015	2020	2025
Everett	US	440	550	550	550	550	550	550
Northeast 2	US	-	-	-	-	-	300	750
Cove Point	US	340	500	600	1,400	1,500	1,500	1,500
Elba Island	US	200	300	350	790	800	800	800
Altamira	Mexico	-	-	-	750	750	750	750
Lake Charles	US	580	800	830	1,130	1,200	1,200	1,200
GOM 2	US	-	-	-	500	750	1,450	1,500
GOM 3	US	-	-	-	-	750	1,050	1,500
GOM 1	US	-	-	-	750	750	1,500	1,500
Baja	Mexico	-	-	-	900	1,000	1,000	1,000
Northeast 1	US	-	-	-	500	750	1,500	1,500
Alaska	US	(178)	(178)	(178)	(178)	(178)	(178)	(178)
TOTAL		1,382	1,972	2,152	7,092	8,622	11,422	12,372
Actual		1,182	1,570	---	---	---	---	---

- ◆ 1 new offshore terminal (Energy Bridge) with a capacity of 0.5 Bcfd was opened in 2005.
- ◆ 19 proposed terminals with a combined capacity of 22.5 Bcfd have been approved by U.S., Canadian and Mexican authorities.
- ◆ Proposals for another 21 terminals with a combined capacity of 26.7 Bcfd have been submitted to FERC and MARAD/Coast Guard for consideration.

Observations: Pipeline/LNG Infrastructure

- ◆ **LNG imports lagging behind expectations thus far.**
- ◆ **Building import terminals (or any type of LNG facility) on the East or West Coasts is not an easy exercise.**
 - Safety and security issues have been used to oppose new facilities.
- ◆ **NPC assumed that LNG import terminals were adequately connected with 25 miles of pipeline for each project.**
 - This assumption is suspect as most expansions include a substantially greater number of miles of pipe. For example, Kinder Morgan's 2 Bcfd Louisiana pipeline will require 137 miles of new pipeline to connect the Sabine Pass facility with the major interstate and intrastate pipelines in the area.

NPC's Storage Capacity Projection (Reactive Path), Bcf

NPC Reactive Path						Delta
	2003	2004	2005	2015	2025	2005-2025
East	2,001	2,005	2,007	2,174	2,369	363
Producing	1,186	1,198	1,205	1,263	1,263	59
West	689	704	707	758	847	140
East Canada	234	234	234	249	264	30
West Canada	303	322	333	333	333	-
Total	4,413	4,463	4,485	4,777	5,077	592
Actual	4,410	4,484	---	---	---	---

- ◆ Most recent storage development has been in supply and not market areas.
- ◆ Many recent storage developments have relied on “base gas conversion” to cover development costs.

Observations: Storage Infrastructure

- ◆ **Storage has high value in current market environment.**
 - Significant price volatility and concerns about supply adequacy.
- ◆ **Storage development proceeding according to expectations.**
 - However, future storage expansions likely to be much higher cost than NPC had projected.
 - Base gas, materials and drilling costs are more expensive.
 - New storage infrastructure will likely be developed only if the market is willing to pay a higher cost than current market rates. (Current rates don't justify recently observed costs for storage.)
- ◆ **Market conditions are making it such that “seasonal” storage (i.e., depleted reservoir and aquifer storage) is much more expensive than NPC had projected, creating a market shift from seasonal to high deliverability storage for new capacity.**
 - Most high deliverability storage is in the Gulf Coast region however.

Recent Regulatory Activity

◆ 2005 Energy Policy Act.

- Clarification of FERC's exclusive authority to site LNG terminals.
- Opportunity for market-based rates for storage capacity, regardless of "market concentration" hurdle.
- Clarification and enhancement of FERC's role in coordinating permitting decisions for gas infrastructure projects, including a federal appeals process for permitting disputes.

◆ Recent FERC action.

- Reduced certification timeline.
 - » "Pre-filing" requirements.
- NGA Section 3 (rather than Section 7) LNG terminal certification.
- Codes of Conduct for Affiliate transactions and relationships.
 - » Broader definitions for affiliates.

◆ State/Regional Regulations.

- Increased use of hedging tools for LDC gas supply.
- IOGC/NARUC Task Force (recommendations only) for long-term contracts.
 - » Attempt to address regulatory barriers/disincentives for long-term contracts.
- RTO/ISO discussions of the structure of capacity payments.

Recommendations - Infrastructure

- ◆ **Federal and state regulators should provide regulatory certainty by maintaining a consistent cost recovery and contracting environment wherein the roles and rules are clearly identified and not changing.**
 - If pipelines and shippers enter negotiated multi-year arrangements that make it possible for a pipeline to be financed and ultimately constructed, FERC should respect the sanctity of those contracts.
 - Still, this concern is just one exception to what is generally a stable environment.
- ◆ **Complete permit reviews of major infrastructure projects within a one-year period using a “joint agency review process.” Projects that connect incremental supply and eliminate market imbalances should be the highest priority and be expedited.**
 - FERC has made significant progress toward shortening the review process.
 - The Energy Policy Act provisions that enhance FERC’s role in coordinating review by other resource agencies and that establish enforceable deadlines and a path for prompt judicial review are an improvement in this area.

Recommendations – Infrastructure (cont.)

- ◆ **Regulatory policies should address barriers to long-term, firm contracts for entities providing services to human needs customers.**
 - The NARUC/IOGCC task force and the NARUC resolution represent progress in terms of raising awareness of this issue and suggesting to individual PSCs that they adopt such policies.
 - Also, beyond LDCs, policies also should address creating greater incentives for non-LDC shippers to contract for firm pipeline capacity (i.e., marketers and electric generators).
 - ISO/RTO policies should provide greater assurances of cost recovery for electric generators that contract for firm pipeline capacity, firm storage and firm commodity supply, especially when such generators are required for maintaining reliability.

Recommendations – Infrastructure (cont.)

- ◆ **FERC should allow operators to configure transportation and storage infrastructure and related tariff services to meet changing market demand profiles.**
 - FERC has yet to re-visit its policy that precludes pipelines and shippers from negotiating rates based on commodity price indices.
 - FERC also should be receptive to industry proposals seeking greater flexibility in the pricing of capacity for the “anchor shippers” that provide the support for getting new pipeline projects launched.
- ◆ **Regulators should encourage collaborative research into more efficient and less expensive infrastructure options.**
 - Regulators have left collaborative research to the market.
 - Last year, FERC rejected the application to re-authorize the Gas Research Institute surcharge program to fund collaborative industry research.

Questions for Additional Discussion

- ◆ Is additional action required for commodity and pipeline contracting to create certainty for gas supply development?
- ◆ Is additional streamlining of the pipeline and storage regulatory approval process necessary? How would it help?
- ◆ What is the LDC perspective on the adequacy of pipeline capacity? How are high gas prices impacting them and their consumers?
- ◆ From the LDC perspective, is there enough focus on efficiency and technology?
- ◆ How will the objectives in the recent petition for rulemaking filed by INGAA and NGSA affect gas transmission?
- ◆ Should “anchor shippers”, willing to accept the up-front risk to commit to new gas infrastructure projects, be allowed to lock-in more favorable service arrangements than shippers who contract for capacity at a later date?
- ◆ Are RTO/ISO discussions on the structure of capacity payments addressing the critical issues of future gas infrastructure development, considering that much of the projected growth in gas use is for power generators that have, to date, been mostly avoiding firm capacity commitments?